PUBLISHED BY THE SOCIETY FOR GROWING AUSTRALIAN PLANTS—REPRINTED IN 2,000 COPIES

Australian Plants

Registered at G.P.O., Sydney, for transmission by post as a periodical.

PRICE: THREE SHILLINGS
MARCH, 1960 Vol. 1, No.2

PROSTANTHERA NIVEA var. *INDUTA*

A striking pink form of this species of mint bush growing in a garden at Hornsby, N.S.W. A native of inland mountain ranges of N.S.W., growing to a height of 3-4 feet where its normal colour varies from pale lavender to the very deepest lavender blue.

Photograph by P. Althofer

PROSTANTHERA MEGACALYX

A lavender blue species from the far west of Queensland. Usually a small shrub of 2 to 3 feet, the flowers may be as large as 1¼ inches long.

How to Grow Mint Bush . . . by A. M. Blombery

The Genus Prostanthera (Greek, protheke—an appendage, referring to the appendage on the anthers), commonly called mint bush due to the aromatic odour of the foliage, belongs to the family *Labiatae* (Latin, labiatus —lipped, receives its name from the flowers which usually have a two-lipped corolla) which embraces the common culinary herbs

The *Prostanthera* genus has the following characteristics— opposite leaves, the flowers have a two-lipped corolla and calyx, the lower lip is three-lobed and longer than the upper two-lobed lip, there are four stamens with an appendage on each anther, the stigma is divided at the end into two small lobes, and the fruit consists of four small nuts which are surrounded by the two-lipped calyx during development.

There are many beautiful species which vary from small spreading types like *P. denticulata* (Latin—with small teeth, found on the edges of the leaves), small bushy compact types as *P. incana* (Latin—hoary, appearance of the shrub) to the upright growing and more widely known species such as *P. ovalifolia* (Latin—with oval leaves) or Purple Mint Bush, and *P. lasianthos* (Greek—shaggy flowered) Victorian Christmas Bush. The *Prostanthera* colour range is wide and ranges fom white, pink, red, mauve, purple and blue and so should satisfy all tastes. The species *P. incisa* is possibly one of the most delightful aromatic shrubs one can grow, as the mere fact of watering the shrub brings forth a most pleasant aroma.

All of the Prostanthera species are rapid growers, although varying greatly in size and habit of growth. Under cultivation the species may be somewhat short-lived, and, unless a well-drained position is provided, losses frequently occur during continual heavy rain, particularly where the soil is of a heavy nature, as the roots rot readily. In their natural habitat, the majority of the Prostanthera species are found in well-drained positions with protection from larger shrubs or trees or a protection of the root system by leaf mould and the like.

In selecting a position in the garden in which to grow a Prostanthera species, the first and essential requirement for success is a well-drained soil. Although soil of a light nature is best it is possible to grow mint bush in a wide range of soils. A morning sun aspect is best but not necessary, for mint bush is adaptable. Where the garden is poorly drained, reasonable success can be obtained by building up the bed twelve inches or more above the surrounding soil; in such cases, watering should not be neglected during dry periods.

In selecting a plant to grow in the garden, a well-established healthy looking plant should be aimed at, as many losses of young native plants are not due to the difficulty in growing the particular species, but in many cases to the planting out of shrubs before a good root system has developed or the plant has properly hardened. After planting the mint bush, it should be remembered that the shrub has been growing under nursery conditions, receiving daily care, and, until well established, in the garden, the same attention should be given. Much disappointment and losses of native plants will be avoided if the above points are borne in mind.

Whilst the young plant is developing, tip pruning, i.e., the pinching out of the growing tips, will produce a much bushier and compact shrub. Light pruning is much better than heavy cutting back of the shrub after flowering; particularly on older plants, as severe pruning, that is cutting of hardwood, frequently kills the shrub.

The Genus Prostanthera

By G. W. ALTHOFER

The Genus Prostanthera (pronounced pros-tan-th-era), comprising over 70 species and a number of varieties, is more truly Australian than Eucalyptus, Acacia, Grevillea, Melaleuca or any other of the more profuse genera of well known Australian plants. Under the common name of Mint Bushes, the Prostanthera species are known and loved from one end of the Commonwealth to the other. This happy state is mainly due to the beauty of one species, the purple Mint Bush—*P. ovalifolia* (oval-if-olia)—which comes to us when spring is at its zenith and when the bushland is fragrant with the scent of a hundred species of flowering shrubs and trees.

The mint bush flowering comes as the seal of perfection, for no other is more floriferous nor more shapely, with the added attraction of the aromatic leaves, which, when scarcely brushed in passing, give to the air around a cloying sweetness—a gift redolent of bushland fragrance. There are many others, however, which vie in beauty with the purple mint bush, for who, on seeing for the first time the soft lavender blue loveliness of *P. induta* (in-du-ta) *(P. nivea* var. *induta),* the Warrumbungle Mint Bush, high on the sun-scorched peaks, foaming like a soft blue waterfall over the cliffs—or high in some cleft in a pocket hankerchief of leaf mould clinging in lonely state, can ever forget the sight. As long as life is with me—and perhaps beyond the grave—who knows?, I shall remember the vision of loveliness of it, the size and colour of it, each flower backed by the large "Granny Bonnett" calyx and flanked by mealy-white leaves and stems, did something to my heart that no flower before or since has done.

It was several long years before I was to see *P. induta* in situ, but one day in late September in the 1940's, in company with Peter, I saw for the first time high on the cliffs of Mt. Naman, the first flowers of that spring showing their faces to the afternoon sun. The following day we scaled the cliffs on the northern side of the huge outer wall of the ancient volcano. This in itself was a breath-taking task; no direct ascent was possible, but by means of working along the ledges until a break was found in the sheer walls we finally accomplished the climb to find ourselves in a paradise of flowering shrubs—for here on the top of the 3,000 ft. mountain was a small plateau with rock pools and running water, and dozens of flowering shrubs to make the miniature cliffs around the pools bright with colour. A tangled mass of *Kunzea ambigua* (pink and white forms), *K. parvifolia* (purple), *Anthocorcis albicans* (creamy yellow), *Acacia cultriformis* (yellow) were there, whilst in rock pockets were the most perfect bushes of *Prostanthera induta* I have ever seen, with lavender blue flowers just breaking, and far beyond to the east, as though suspended in space, the perfect cone of Tooraweenah spire scintillated in the morning light. To the north the vast bulk of Mt. Exmouth loomed like a brooding colossus with fixed stare across the western and northern plain land. All around was a tangled mass of ranges, spires and peaks—some timbered, some showing the man-made scars of axe and fire, whilst others are all bare rock like black fingers pointing to the sky.

This *Prostanthera* growing in rock pockets and crevices may at first sight appear to be an unwilling recruit to the gardens of a nation, but such has not proved the case. The soil of these rock pockets is composed largely of leaf mould and decomposed stone, and this gives perfect drainage with nearly

always moisture seeping along the rock faces beneath the roots. In garden practice it has been found to grow to perfection on the gravel ridges of of our inland country and on the lighter soils, as well as on the richer soils provided the drainage is good. Like the bulk of the mint bushes. *P. induta* likes plenty of summer moisture as well as liberal applications of leaf mould.

It is a far cry from these upflung volcanic spires and sheer cliffs of the Warrumbungle Ranges to the sandstone cliffs and flat tops of the Grey Range in the far west of Queensland. But there in small pockets, growing in a minimum of soil is a mint bush with striking characteristics. Only recently has this species, *P. megacalyx* (mega-ca-lyx), been known to science, and how such a striking and unique species could remain so long hidden will ever remain one of the major mysteries of botanical discovery. The huge flowers —for so tiny a plant—are in themselves sufficiently noteworthy without the beauty of colour and form which go to make this the loveliest of the smaller species. The flowers are lavender blue, and of a size not exceeded in any other species. Though they vary in size and colour on individual bushes, quite often flowers are seen up to 1¼in. long and ¾in. wide.

My first experience with this beautiful species was during the early spring of 1946 when I received a parcel of flowers including *Prostanthera suborbicularis* and *P. megacalyx* from Mr. D. Gordon. He found this (which had been described only a few years before by C. T. White and Francis of Brisbane Herbarium) growing on top of the Grey Range, west of Quilpie, and again on Ambethala Range south from the far west of N.S.W. through the southern portion of western Qld. Although at no place does the range reach a high elevation, there are some quite considerable cliffs on the eastern side of the range, and the coloration of the sandstone when struck by the first rays of the morning sun can only be described as superb. Where the road from Quilpie to Windorah crosses the range the western slope is typical gibber country, thickly covered with Wilga *(Geijera parviflora), Eremophila* Spp.*Eucalyptus,* etc. It is on the very top of the range in a barren and inhospitable setting that *P. megacalyx* grows. This region of rock, blasted by the fierce heat of summer and the bitter winds and frosts of winter, has given to the world this lovely flower.

There are doubtless many places in western Qld., far from the haunts of man and the man-made desolations born of axe and fire, where *P. megacalyx* grows. We saw it a few miles from Charleville on top of Ambethala Range, and again it grew and thrived on a rocky flat top where soil was practically non-existent. *P. megacalyx* is a small shrub of 2 to 3 feet, and is rivalled only in the size and beauty of its flowers by *P. magnifica* of Western Australia.

The Snowy Mint Bush (*P. nivea)* being the first of many species of Prostanthera I was destined to find growing in situ, it is only fitting that this lovely species should also be amongst the first of the genus to be known to gardeners in England and the continent of Europe. My second experience with a Mint Bush species was during 1933 when a plant of *P. ovalifolia,* the thousand flowered purple mint bush came into my possession. It was to be many years before I was to see this species growing in its native habitat, but this tiny plant (at the time) with its tangy foliage was in actual fact the first mint bush I had grown under garden conditions. There was in all possibility no inkling in my mind that I would one day be writing the saga of the Prostanthera Genus. Seed of *Prostanthera ovalifolia* collected there by W. Giles in October, 1951, has germinated prolifically nine (9) months later. My experience of seed of the various species has been that unless it is

Continued from Page 10

The Treatment of Seed

Some findings following the application of Calcium Hypochlorite to hard testa seed.

By H. BOYD

In the process of rendering Eucalyptus seed bacteriologically sterile by immersion in an equeous solution of Calcium Hypochlorite and household detergent (this was being done for the purpose of growing seed in flasks under controlled conditions on sterile vermiculite wetted with a nutrient solution), the writer noticed the testa or outer covering coming away from the embryo of the seed. The phenomena was watched until some of the seed fell into two parts, the outer covering being stripped from all seed. This took about half an hour. The time varies with different species.

The experiment was duplicated, and the reaction stopped before the testa was completely removed. The seed was then washed several times in sterile water until most of the chlorine was washed away. It was sown on the prepared medium in flasks and germination was very rapid. Some cotyledons opened in 48 hours. This was a surprise because of the damage to the covering or testa and the toxicity of Calcium Hypochlorite. All seed germinated.

Several other species were treated with different results.

A series of tests were decided upon in open seed boxes. The medium was vermiculite wetted with a solution of "Aquasol" acidified slightly with hydrochloric acid (Ph.6). (Sydney water at times is very alkaline.) Germination was rapid and the growth spectacular. It was thought by some members of the Native Plant Propagation and Research Society that this might have been due to the new polythylene propagating house being used, so the experiment was duplicated in a standard glass house. The results were about the same.

The seed was sown on the 28th December, germination taking from 7 to 10 days. On the 26th January, the heights were:—

Acacia lanigera A. Cunn.	3"
Acacia saligna Wendl.	4"
Pavonia hastata Cav.	3"
Albizzia lopantha Benth.	10"
Eucalyptus cinerea FvM.	6"
Eucalyptus preissiana Schauer.	5"
Eucalyptus pyriformis Turez.	4"

More than 30 species of Eucalyptus have been treated as well as seed of many other genera:—Callistemon, Melaleuca, Leptospermum, W.A. Boronias, Acacia, Cassia, Stenocarpus, Hakea, and good results have been had with Prostanthera.

THE TREATMENT OF HARD TESTA SEED WITH CALCIUM HYPOCHLORITE

To prepare the solution for the sterilisation of seed, take 10 grams of calcium hypochlorite and 140 c.c. of water (¼oz. calcium hypochlorite, approx. half cupful). Mix in a flask that can be fitted with a tight fitting cork, allow to stand for one half hour, pass through a filter paper, add a couple of drops of household detergent (used here as a wetting agent) and then stopper the flask tightly. If a method of filtration is not available, allow the mixture to stand a little longer in the stoppered flask until most of the "lime" falls out of suspension, and then the clear liquid can be poured off into another flask to be again tightly stoppered.

Seed up to the depth of 2 inches is placed in a 1" test tube, the tube to be about three parts filled with the liquid and the tube tightly stoppered. The seed should be watched with a magnifying glass and as soon

as the testa begins to crack or come off it is time to stop the experiment by pouring off the liquid and placing it with cold sterile water. The seed is washed until the strong odour of chlorine has been dispersed. If the seed floats on the water, the water may be removed by inverting the tube and loosening the stopper a little. The seed is then sown in sanitised soil or vermiculite. The use of a hollow glass tube or pipette with a thumb over the top of the tube is a simple way to distribute seed in water.

The advantage of using the above method for the treatment of seed is not only the splitting of the seed coat to ensure rapid germination, but calcium hypochlorite is a very good fungicide and bacteriacide so the pathogens that inhabit the outer covering of the seed and placental material are reduced, allowing rapid growth and the establishment of strong plants before the germ count can build up.

For the treatment of very hard seed the writer has varied the strength of the solution and at times has used it at a much greater strength. Some seed might have to be soaked for hours, and increasing the strength accelerates the action. Once the reaction starts it is fairly fast, so the experiment calls for close observation. It might also vary in time with the same species due to the instability of the bleaching powder. For this reason calcium hypochlorite (bleaching powder must be kept in a tightly closed container. After having been opened a couple of times it is useless. The clear filtrated liquid, if kept well stoppered is good only for 24 hours.

The dramatic results obtained with Eucalyptus seed were not repeated to the same extent with any other genera except perhaps Clianthus.

EDITOR'S NOTE: Mr. Boyd has been studying this method for many years using many types of solutions at different strength. Readers are urged to use this method, record the results and advise me of the conclusions. Here is an experimental work the most inexperienced amateur can do well. The materials are cheap and readily available from a chemist. One pound of calcium hypochlorite approx. 3/-. Three 6" x 1" Bacloglass test tubes with 7/8" rubber stoppers to fit milk bottles. For filtering, a 3½" glass funnel (6/-) and a packet of No. the solution in one of these test tubes or if a larger quantity is required purchase some good stoppers to fit milk bottles. For filtering, a 3½" glass flunnel (6/-) and a packet of No. 1 filter papers will last for many years. I have used this method with considerable success, using vermiculite or sand in a 4 inch pot with a piece of glass over it. Locate it where it gets morning sun only.

STUDY GROUPS:

Study groups are being formed by members who are particularly interested in the growing of flowers of a particular genus. They will be organised by a leader by correspondence and every member is eligible to join. A membership fee or subscription will not be necessary, the members forwarding a stamp addressed envelope to the leader for reply. The members will exchange notes, seed, plants, etc., to assist in the cultivation and development of these plants to become the pride of their garden. Enthusiasm, not experience, is all that is necessary. Space will not permit a general plant or seed exchange system, this being a function of the State societies, but such a service will be given where necessary to Study Groups wishing to increase the quality or range of their plants.

You may form or join a Study Group for your favourite flower by writing to the Editor. News from existing Study Groups is as follows:—

TELOPEA STUDY GROUP:

Do you wish to grow Waratahs Join up. Seed or plants of *Telopea mongaensis*, *T. oreades* or *T. truncata* is required For new forms of hybrid Telopeas, see the January issue of "The Australian Garden Lover". This is being followed up.

ACACIA STUDY GROUP:

A group to tudy and cultivate our Wattle trees has been formed. This is an excellent group for owners of large blocks of land and for country members.

PROSTANTHERA STUDY GROUP:

A group is being formed now. Ideal for the home gardener interested in this easy to grow, most floriferous subject. Colour transparencies are required.

VERTICORDIA STUDY GROUP:

The next issue will feature the West Australia Verticordias, a trying subject for home gardens in the east. An attack on this challenge will be made commencing with an article and the formation of a study group. Possibly a group exists already Please forward any experiences, advice or colour transparencies you may have.

ERIOSTEMON STUDY GROUP:

The August issue will feature the genus Eriostemon with an article by Jean Galbraith Please forward comments, and any colour transparencies you may have.

NATIVE ORCHID SAUDY GROUPS:

Two groups are planned, the Native Orchid (Terrestrial) Group and the Native Orchid (epiphytal) Group. The article in this issue is the first of a series to introduce native orchids. It is planned to organise the ecorts of those people laready interested in these plants, receive their comments and then print a guide to their cultivation for others.

THE FLOWER . . . PART 1

By HELEN PURNELL

Flowers are the plant organs which are concerned with sexual reproduction and the formation of seeds (cf. asexual or vegetative reproduction by means of bulbs, corms, runners, cuttings, etc.). Flowers are very variable in general appearance. Some are large and brightly-coloured, e.g., *Cassia* and *Hibiscus*, others so small that they are readily overlooked, e.g., *Haloragis (Raspwort)* and *Lemna* (Duckweed). In some plants, e.g., *Salicornia* (Glasswort), the flowers are embedded in the fleshy stems. The structure, number and arrangement of the parts of the flower varies considerably from family to family of flowering plants, and these floral characters are the primary ones used in classification. Variation of the flower structure within a family, and particularly within a genus, is very much less than the variation which may occur in the vegetative characters.

A flower usually arises in the angle between a stem and a leaf or scale-leaf (i.e., in the axil of the leaf or scale-leaf). The leaf or scale-leaf is known as the bract and the flower is said to be subtended by the bract. The flower may be stalked or sessile (without a stalk).

The parts of the flower are arranged in several series or whorls on a structure known as the receptacle. The receptacle may or may not be conspicuous and can vary in shape. but for the moment these modifications will not be considered. In a typical flower there are four main kinds of floral parts; sepals, petals, stamens and a carpel or carpels, and these are arranged so that the sepals compose the outermost whorl on the receptacle and the carpel or carpels are innermost. The whorl of sepals is known as the calyx and whorl of petals as the corolla. The calyx and corolla together are called the perianth, but the use of this term is usually restricted to cases where the sepals and petals are alike in shape and colour, e.g., *Burchardia* (Milkmaids), or where either the sepals or petals are absent, leaving only one whorl, e.g. *Grevillea*. The stamens collectively are called the androecium and the carpel or carpels, the gynoecium.

THE CALYX

The sepals are usually green and leaf-like, and enclose the other parts of the flower in the bud. If, in the bud, the sepals meet together edge to edge, they are said to be valvate, e.g., *Solanum*, and if the edges of the sepals overlap they are said to be imbricate, e.g. *Cassia*. The sepals may be free from one another, e.g., *Cassia*, united at the base only, e.g., *Boronia*, or joined into a tube, e.g. *Pultenaea* (Bush-pea). The number of sepals in a tubular calyx usually can be deduced from the number of lobes or teeth at the top of the tube. The calyx normally persists during the flowering period but is sometimes deciduous, i.e., it is shed as the flower opens, e.g., *Bursaria* and *Papaver* (Poppy). In some species the calyx is persistent in fruit. e.g., *Solanum*. The calyx is occasionally covered with prickles or spines,

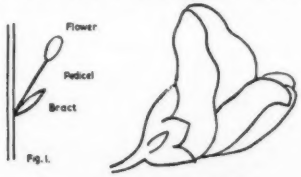
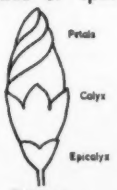


Fig. 1.

Simple Bract,

Tubular calyx of Pultenaea showing one of the bracteoles

Bracts at the base of the calyx of Epacris.



Epicalyx of Lavatera(Malvaceae).

e.g., *Solanum sodomaeum* (Apple of Sodom). Extra bracts may be borne on or at the base of the calyx, e.g., in *Pultenaea* there are two small bracts (bracteoles), one on each side of the calyx tube; whilst in *Eutaxia* the bracteoles are found on the pedicles below the calyx. Large numbers of bracts at the base of the calyx in *Epacris* (Heath) and other members of the family Epacridaceae are similar in structure to the sepals.

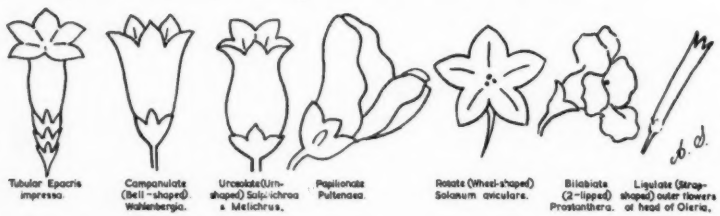
In many members of the Malvaceae, e.g., Hibiscus, the calyx appears to be double due to a ring of bracts borne on the calyx itself. Such a structure is known as an epicalyx. Sometimes a cluster of flowers is subtended by several whorls of green or coloured bracts. These are known as an involucre, e.g., *Telopea*.

THE COROLLA

The petals are frequently coloured and delicate in texture, and they are arranged on the receptacle inside the whorl of sepals. Normally the points of attachment of the petals alternate with those of the sepals and therefore there is usually an equal number of parts in each of these whorls. There are some exceptions, e.g., *Papaver*, has 4 petals and 2 sepals. Petals are free from one another or united (gamopetalous) and they are usually either valvate (the petals meet together edge to edge) or imbricate (petals overlap) in bud.

An important point in a discussion of the arrangement of floral parts is that of symmetry. A flower is said to be regular (actinomorphic) if the members of the calyx and corolla are arranged in a regular fashion on the receptacle and the flower can be divided into equal halves by two or more vertical planes, e.g., *Bauera* and *Burchadia*. A flower is irregular (zygomorphic) if the parts are not regularly arranged on the receptacle, and then only one vertical plane will cut the flower in equal halves, e.g., the pea flowers (*Pultenaea*, *Hovea*, etc.), *Prostanthera* (Mint Bush) and *Pelargonium*.

Some of the common corolla shapes are illustrated below.


Tubular Epacris impressa.
Campanulate (Bell-shaped) Wahlenbergia.
Urceolate(Urn-shaped) Sollya heterophylla & Melichrus.
Papilionate Pultenaea.
Rotate (Wheel-shaped) Solanum aviculare.
Bilabiate (2-lipped) Prostanthera.
Ligulate (Strap-shaped) outer flowers of head of Olearia.

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MINT BUSHES FOR EVERY GARDEN

By DON SANDS

CHOICE OF BEST FORM

One species of mint bush *Prostanthera ovalifolia* has been widely grown in gardens, but unfortunately the forms most commonly sold are sensitive to collar rot resulting in a reputation for being short-lived. These sensitive forms which are actually *Prostanthera ovalifolia* var. *latifolia* have small serrations on the leaves, and if not properly drained the plants will rarely live longer than five years. Much better and more resistant forms have no serrations on the leaves and give a better show of flowers. Also the serrated leaved forms usually produce vigorous growth at flowering time, whereas the smooth edged varieties do not put on new growth until after the flowers have died, allowing the coloured mass of flowers to be "undiluted".

All the species vary; when cuttings are taken one can choose at flowering time the form best suited. A well-drained and smooth leaved plant of *P. ovalifolia* will live to 10 to 15 years with no sign of damping off, maintaining dense foliage and masses of flowers every year, whereas the serrated forms grow straggly unless pruned and flower much less densely.

A MINT FOR ANY SITUATION

Many colours other than blue and purple can be found in the mint bushes and produce as colourful a display as the better known species. Red and orange forms of *P. aspalathoides* like a well-drained rockery and plenty of sun. They grow into neat little shrubs, only a few feet high with grey foliage and tubular flowers. There are many white and near white species including *P. nivea, P. phyllicifolia* and *P. linearis. P. cuneata* is a spreading shrub with large white flowers speckled with mauve from Mt. Kosciusko, while *P. lasianthos* grows into a tree up to 30 feet or more in shaded situations and is covered with white flowers in December

From the blue and purple species one can choose a species for any situation. Large showy shrubs include *P. ovalifolia, P. rotundifolia, P. melissifolia* and *P. incisa*, while *P. denticulata, P. marifolia, P. incana, P. stricta* and *P. seiberi* are some of the best smaller shrubs *P. rotundifolia rosea* is an exceptionally good variety with pink flowers and is a "must" for all well-drained rockeries.

Some of the species flower throughout the year. One form of *P. empetrifolia* flowers best in autumn and will tolerate bad drainage better than the other species.

More suitable for gardens than the usual *P. ovalifolia* is *P. incisa*. One form has a purple calyx which colours well some time before flowering. This same form is vigorous, very hardy and quick to propagate from cuttings. Forms vary from white to deep purple, while their leaves may be dull or glossy, pale or dark green, always with short leaves ½ to ¾ inch long with incised tips.

MY CHOICE OF BEST MINT BUSHES

By C. W. ALTHOFER

Selection of the best plants will be guided by where you live and what is the nature of your soil. Any friable soil will grow good mint bushes provided you have water for plants when needed. If you want a mint bush to live long, do not force it with constant watering. Space waterings so that plants will begin to droop then water well rather than a little each day. If the soil is heavy and badly drained make a raised mound, 6-12 inches, above the surrounding garden.

Here is a table showing reliable species and where to grow them.

P. ovalifolia CMS DI, *P. melissifolia* CMS X, *P. nivea* CMS DI, *P. denticulata* CMS, *P. incisa* CMS X, *P. striatifolia* S DI F, *P. incana* CMS X, *P. aspalathoides* CS DI F, *P. rotundifolia* CMS DI, *P. cuneata* MS X, *P. rotundifolia rosea* CMS X, *P. discolor* CMS X *P. lasianthos* CMS X.

C—coast, M—mountains, S—slopes, DI—dry inland, X—best in part shade, F—full sun.

In his article "Mint Bushes For Every Garden", Don Sands is quite correct is saying that the form of *Prostanthera ovalifolia* sold by many nurseries is more prone to collar rot than the smooth-leaved form which 25 years ago, was the only one sold as this species. To my mind this serrated leaved form (which is entirely coastal in habitat) is *P. ovalifolia* var. *latifolia*. The smooth leaved form extends from near Leeton-Griffith, along the western slopes to Grenfell, the Nangar Mountains and the southern approaches of the Hervey Range. An even smooth-leaved form now 23 years old and still healthy. I am not in complete agreement with him that *Prostanthera incisa* is "more suitable here if you have room for this larger shrub, with *P. incisa*, *P. nivea* var. *induta*, *P. rotundifolia* and *P. incana* not far behind.

THE GENUS PROSTANTHERA—Continued from Page 4

fresh there is little chance of germination. Twelve-months-old seed of *P. nivea* gave only five (5) per cent germination. Seed of *P. megacalyx* from western Queensland gave no germination at all after holding for 15 months, but 9 months previously gave 20 per cent. Doubtless there are other factors affecting germination of these and other plant species. It seems almost certain that plants of this genus producing a heavy crop of seed such as *P. striatiflora* and *P. nivea induta* have a low viability when seed is fresh. On the other hand I have seen countless thousands of *P. nivea* germinate when conditions are favourable and this species is one that seeds freely.

In August, 1936, we found a beautiful mint bush species growing in iron and sandstone country three miles from Dubbo on Peak Hill Road. A low growing compact bush of 2 to 3ft. with striking terminal racemes of violet flowers, though sometimes much lighter. Several plants of a pink flowered form were found by Hal Holmes. This small leaved species has been variously determined by Herbaria as *P. empetrifolia*, *P. pulchella*, *P. howellae* and *P. denticulata*. The fact that the flowers are not axillary rules out *P. empetrifolia*, a coastal species. *P. pulchella* has since been also dismissed by the botanist who first determined it as above. *P. howellae* may also be ruled out by virtue of the fact that flowers are in pairs in leaf axils. I feel that in spite of the non-denticulate leaves this puzzling species is nearer to *P. denticulata* than to any of the other three mentioned. In fact Bentham, in a foot-note to his description of *P. denticulata* states inter alia "the species is remarkable for the acuminate bract-like floral leaves and like *P. hirtula* forms almost a passage from the racemose to the axillary inflorescences". The Dubbo species has these floral leaves from which emerges the leafless flowering raceme. This lovely small species is found also on the north-eastern side of Dubbo, Goonoo Forest, Pilliga Forest, Elong and near Dunedoo, also near Manildra and in the Hervey Ranges. It appears to cling to the area bordering the old inland sea fringe, the home of so many of the loveliest of our wild flowers. Its place in similar country in Queensland is apparently taken by *P. parvifolia*. Though this latter species is in no sense closely related. However, the superficial likeness of the two species is there. They grow in similar country and strangely enough both are at some points associated with that strange plant *P. leichhardti*.

In 1937 I made my first contact with *P. leichhardti* growing near the forestry cottage in Goonoo Forest. Beneath the shade of Ironbark (*E. crebra*), the dwarf *Euc. dwyeri* and *Euc. viridis*, this species is surely one of the strangest of the genus with its "blue stone" blue flowers looking for all the world like butterflies with folded wings resting amongst the foliage. The leaves are extremely aromatic—pleasantly so. This is one of the few species not taking kindly to garden culture. Closely related to this species are *P. ringens* which to this day is somewhat a mystery species and *P. lepidota* which latter species is confined to th lower end of the Carnarvon Range, in the vicinity of Morven and Mitchell, Queensland, around Glenmorgan in central southern Queensland, grows the upright form of *P. leichhardti* on hard, stony country. It was here that Mr. D. Gordon first found plants of that rare yellow flowered form of *P. leichhardti*. I know of this fine colour variation from no other area. Yellow is a colour rare amongst mint bush species and the only other instance I recall is the even rarer yellow flowered form of *P. espalathoides*.

Propagation of Prostanthera

By A. M. BLOMBERRY

Amongst the native plants, Postanthera species are one of the easiest to propagate and may either be by cutting or by seed. Growing new plants from cuttings is considered the easiest and best method as flowers are produced earlier and selected forms can be reproduced. Cuttings of side-shoots taken in the late spring after flowering or in early autumn may be used. Cuttings taken in autumn will flower as small plants the following spring, as the immature flower buds are present on the cutting. To prepare cuttings the small side shoots three to four inches in length are removed from the shrub with a small heel; next cut off the lower leaves and trim off any rough or loose bark from the base of the cutting including any developing seeds.

Coarse clean river sand or vermiculite makes the most satisfactory medium for striking cuttings. If so desired, a small amount of peat moss may be added but is not essential. Any container, such as a tin or pot may be selected—preferably one large enough to allow for a layer of coke, ashes, stones or the like at the bottom, then about three to four inches of the sand or the like, leaving a space of two to three inches at the top. Consolidate the medium in the pot and place the cuttings approximately two-thirds of their length into the medium, and when all cuttings have been set, water to consolidate. If a cold frame is available place the pot in the frame, when not available the container should be placed in a protected position where, at the most, only morning sun is received. The most important point is to ensure that the cuttings do not at any time dry out; during hot weather, it may be necessary to water twice a day. Standing containers in a polythene bag helps conserve the moisture. The cuttings should have rooted by the autumn and may be potted into tins, etc., and held until well established.

Prostanthera species may be raised from seed by collecting the small nut-like seed, of which four develop, from a fertilized flower. Sow the seed in a seed box, tin or pot, with a soil, cover to a depth of the thickness of the seed and water well; they must be kept moist at all times. Transplant the seedlings into tins, etc., after the second set of leaves have formed.

Finally ensure that watering is not neglected at any time as this is a common cause of losing cuttings and seedlings.

Preserving the Rare and Local Species

By J. H. WILLIS

Horticulture, throughout the centuries, has played a very important role in salvaging for posterity certain species of plants that may have become extinct. Moreover, the successful garden culture of a rarity tends to eliminate the incentive for continued raids on its native haunts by unscrupulous collectors.

Cootamundra Wattle (*Acacia baileyana*) was actually growing in gardens before the very restricted extent of its natural habitat became known, a few scattered patches within 16 miles of Cootamundra and within 14 miles of Temora in New South Wales. It could easily have been cleared out of existence, but for the poor, stony, terrain occupied by existing stands.

Such cases could be multiplied, and it is here that the Society for Growing Australian Plants can help to serve the cause of science: by introducing into our garden borders such wild flowers as are either becoming scarce or are so localised that few people ever have any hope of enjoying them. There are not many who would disapprove this objective, and members of the Society dedicated to their propagation from seed and cuttings—NOT by digging up young plants or bulbs in the bush.

A sad story is that of the peerless White Diuris Orchid (erroneously called *D. alba*). Once it grew in sheets over basalt grassland immediately north-west of Melbourne, and even 30 years ago there were still a few large patches to be seen at Tottenham, St. Albans and Sydenham. At least one vandal had a mania for digging up tubers, every flowering season, and transferrings them to his Footscray garden. Today, the White Diuris teethers on the very bring of total extinction, and it will soon, perhaps, be numbered by individual tubers—a fate that has already overtaken several rare orchid species on the chalk downs of England. The Purple Diuris (*D. punctata*) enjoyed a much wider distribution in Victoria than its white relative of the basalt, and it was abundant until decimated by grazing animals. Railway enclosures provided a last refuge for this regal orchid, but now, track duplications near Pakenham and Violet Town have rung the knell of its two largest remaining strongholds.

Effective treatment have yet to be devised before any of our native terrestrial orchids can be successfully perpetuated in gardens; and, at present, their removal from the countryside (even in large sods of earth) must be deprecated—"leave them where they are to set seed" should be the attitude alwdays unless plants are already doomed by various forms of land utilisation.

There are cases when anyone is justified in removing whole plants that are threatened by plough or "bull-dozer". It is painful to contemplate what wonderful things have been pushed out of existence on the sandplains of Western Australia, when these are turned over to wheat or sheep, and the destruction there still goes on apace. What, for instance, will be the future of the glorious, rosy-flowered Rainbow Plant (*Byblis gigantea*)—once common near Perth—when its few habitats are cleared and drained? By all means let us get some of these treasures acclimatised to garden culture before it is too late.

The Australian Cornflower (*Centaurea australis),* now scarce in New South Wales, has not been seen in Victoria for a century and is regarded as extinct in that State. Austral Anchor-plant (*Discaria pubescens)* is presumed to have disappeared in Tasmania and is now a rarity in Victoria. Both species had the misfortune to inhabit good pastoral land, but they do not seem to have been tried out in gardens. The rock-loving Velvet Daisy-bush (*Olearia pannosa)* has larger flower heads than any other of its large genus in Victoria, and is a handsome shrub; but occurrences are now reduced to vanishing point, through the depredations of rabbits and other animals. Happily, it strikes well from cuttings and is not unknown in garden collections.

Attempts should be made to propagate all decorative plants of very localised occurrence, in case their natural habitats are destroyed, e.g., the endemic Victorian *Pultenaea subalpina* (rosy-purple) and *P. patellifolia* from parts of the Grampians, *Acacia dallachyana* and *A. phlebophylla* from Mount Buffalo, and the astonishing *Acacia enterocarpa* ("Jumping-Jack Wattle") from between Nhill and Serviceton. Three other very restricted Victorian endemics are already in cultivaion, but deserve much wider recognition, viz., pendulous *Acacia howittii,* golden *Grevillea chrysophaea* and the delightful silvery *Eucalyptus crenulata* which is known from only two little patches of a few acres—both on privately owned land, liable to be cleared. Before leaving the subject of extremely localised plants in Viictoria, one could make out an imposing list of species which range through one or more States, yet have only a "pin-point" occurrence here. No effort should be spared to safeguard all these in their natural environment here are some of the more spectacular, alphabetically arranged:—

Acacia decora, A. pendula, A. triptera, Alectryon subcinereus, Boronia ledifolia, Borva nitida, Bossiaea walkeri, Coprosma moorei, Daviesia wyattiana, Eremophila bignoniiflora, E. polyclada, Eucalyptus fasciculosa, E. maculata, Eucryphia moorei, Geijera parviflora, Grevillea barklyana, Hibiscus farragei, Isopogon anemonifolius, Livistona australis, Phebalium obcordatum, Pultenaea altissima, P. donsifolia, P. vestita, Scaevola depauperata, Solanum violaceum, Swainsona greyana.

The endemic species of Mount Kosciusko, Blue Mountains and Rylstone region of New South Wales, Tasmanian peaks, Flinders Range (S.A.), Stirling Range, Mount Barren and Mount Lesueur (W.A.); Bellenden-Ker Range in North Queensland and other mountain fastnesses, cry out for protection from fire, grazing and other disturbances of human origin.

Many a flower-lover would be elated to see the cream and honey-scented wedding-bush (*Ricinocarpus pinifolius)* burgeoning lustily in his own garden plot, but the glorious display of its native coastal heathland has yet to be repeated on some distant, alien ground. Perhaps the cause of frequent failure is related to a delicate symbiosis with fungi peculiar to heathland soils. Who will be first to tame the entrancing flannel-lower of Central Australia (*Actinotus schwarzii*)? Silken heads of this magnificent three-foot shrub are up to four inches wide, but its abode consists of several almost inaccessible rock-walls in the heart of the Macdonnell Ranges.

On the other hand, a very widespread common herb-like Blue Pincushion *(Brunonia australis)* has defied most gardeners' efforts to bend its ways. Out in the bush, it spreads wantonly for many square yards and makes an impressive splash of colour about Christmas-time; why can't we grow it as a herbaceous border-plant like thrift or primroses or glorified cultivars of the common field daisy—why indeed?

The Mystery of Dendrobium Falcorostrum

By B. J. BEAR

At the beginning of the Cretaceous Period, 90 million years ago, when Australia was connected by land with Asia, it could be accepted that most of the existing order of flowering plants were well established througout the world and many used the land bridge to spread to Australia, at the climax of the era, 40 million years later, the continent became isolated and our unique flora as we know it today evolved in isolation.

The Antarctic Beech, (*Nothofagus moorei*), the host tree of *Dendrobium falcorostrum*, is one of the few unchanged survivors of the Cretaceous Period and their great age is signified by their gnarled twisted, moss, fern and lichen covered bases which are the root systems exposed by centuries of erosion.

It would be reasonable to suppose that *Den. falcorostrum* evolved in early times in close association with the Antarctic Beech as to-day there are only three known stands of *Nothofagus moorei* established between the 3,000 ft. and 4,000 ft. level on the McPherson-Dorrigo Plateau and Gloucester Tops, nearly all providing accommodation for large groups of *Den. falcorostrum*. Changing climatic conditions are slowly eliminating the Antarctc Beech, decaying and fallen trees are being replaced by more vigorous rain forest flora, and *Den. falcorostrum*, reluctant to adopt another host, may also see its elimination. It has only been found growing in small quantities on tree ferns and on rocks where established clumps have fallen. It appears that this beautiful native orchid can be saved from extinction only by propagation and protection of natural habitat.

AUSTRALIA'S NATIONAL PRESERVATION JOURNAL
(A non-profit making venture dedicated to preservation by cultivation.)
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Australian Native Orchids

By R. F. LEANEY, F.R.H.S.

Orchids have always been looked upon as rare plants, but such is very far from the truth in a number of species There are some twenty-five thousand (25,000) species of orchidaceae. The daisies, with about eighteen thousand (18,000) species, run a very poor second. The grasses, always thought to be the most plentiful of plant life, run a long way back with several thousand, and this of course also includes the bamboos.

Having established beyond all doubt that we have plenty of scope for our endeavours, let me say right here and now that "Australian Native Orchids" are not difficult to cultivate, indeed very many are downright simple to succeed with, even under the most ordinary conditions met with in anyone's garden. As the greatest confusion exists in the identification of native orchids, I have been invited to contribute a series of articles to be printed in alternate issues of the journal to introduce the species that are more easily grown.

This illustration shows *Dendrobium falcorostrum,* one of Australia's finest species. First described by Fitzgerald in "The Sydney Morning Herald", 18th November, 1876 (because, to use Fitzgerald's own words, "there being no scientific periodical in the Colony.").

Dendrobium falcorostrum is named for the shape of the column, the point of which very closely resembles the curved beak of the falcon. Found invariably on the Antarctic Beech, *Nothofagus moorei,* where it thrives on a few elevated, well watered peaks and plateaux on the north coast of New South Wales; takes very well to cultivation, especially when grown in large clumps in baskets under good "orchid bush-house" conditions. Highly and very delicately perfumed especially in the mornings of warm days; flowers in spring.

Stems or pseudo bulbs about 12 inches long (although I have collected many plants with bulbs from four to 18 inches in length). Slightly tapering to each end. Leaves two to five at or near the apex, quite distichous, almost obovate, two to five inches long.

Flowers frequently inverted, up to twenty-five or thirty, white, slightly striate, large pedicles one to two inches, sepals broader than the petals, both about one and a half inches long. Petals lanceolate, spur truncate, furrowed round the edge, labellum three-quarters of an inch long, white spotted purple, centre lobe long, acuminate, turned up, sides of labellum festooned so as to form a lobe near the centre lobe, the whole resembling the bill of a falcon (hence name). A yellow cruciform gland on the disc and between this and mid-lobe, the labellum is deeply concave, the hollow extending beneath the gland composed of three ridges for the greater part of its lenoth; column short and thick, yellow from below the stigma and spotted with purple, much thickened near the hinge of the labellum, pollen masses longer than usual, pollen preserves very well. Flowers pollinate and coss-pollinate fairly easily, seeds very viable, germinate well under the correct conditions.

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DENDROBIUM FALCOROSTRUM

This lovely easily-grown species from the uplands, almost always found on the Antarctic Beech, *Northofagus moorei,* likes plenty of water and rather more cold than is general. It is a good subject for the mountains and the south. This plant is best potted or planted in big masses in wooden baskets as this type of growing suits it best. On a warm morning in early spring the perfume of *D. falcorostrum* is well worth any trouble you may go to, to get the plant in the first place.

Wholly set up and printed by Surrey Beatty & Sons, Rickard Road, Chipping Norton, N.S.W.